



CALIFORNIA ENERGY COMMISSION

Renewable Transmission Planning Workshop

Distributed Generation Applications of the Model



Agenda

- Introduction
- Case Study
 - 1,000 MW of DG within PG&E territory
 - Limited to bus hot spots located on the 69 kV and 115 kV transmission system
 - 105 MW of DG divided between Santa Clara and Sacramento Counties
 - Limited to buses on the 69 and 115 kV grid
- Conclusions

Introduction

- Process can be used to study specific DG technologies such as residential PV, commercial PV, landfill gas, waste water treatment or biomass alternatives
- Process can also be used to determine screen areas for indepth analysis for DG potential

Introduction Cont'd

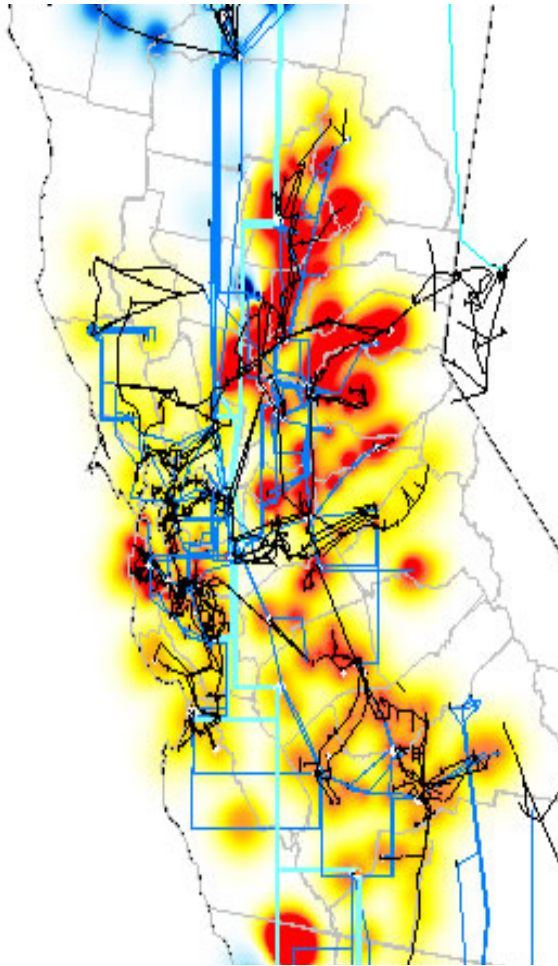
- Because we assign transmission buses to locations, we can filter locations for DG by:
 - Utility
 - County
 - Urban area
 - Zip code
 - CAISO congestion zone
 - Etc.

DG Distribution Profiling

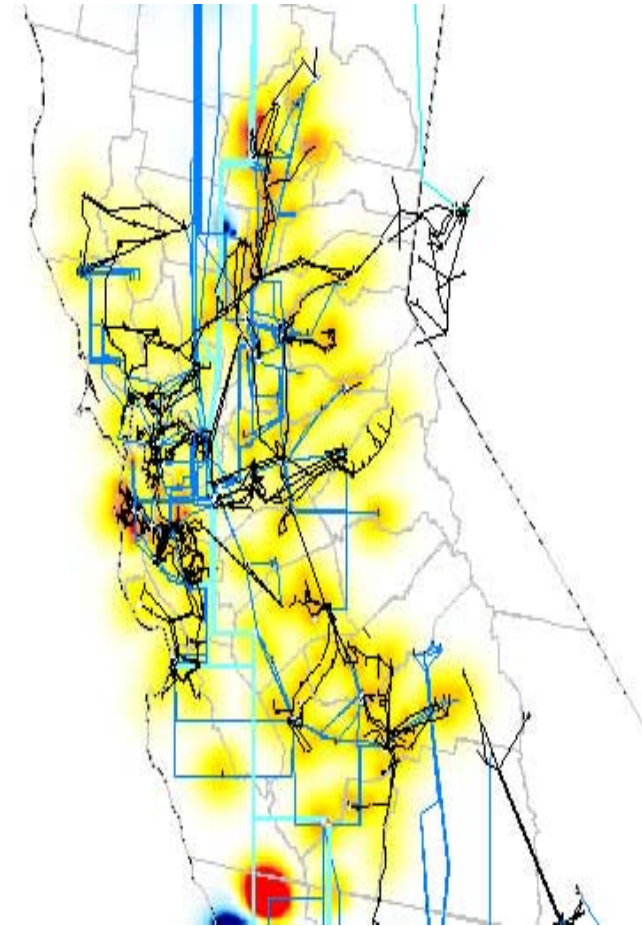
- Selected buses that had WTLRs in PG&E
- Bus voltage ranges from 69 kV to 115 kV
- Model determined that 1,000 MW of DG could be installed on selected buses
- User can now work backwards by filtering buses into study areas
- Can study what aggregation of technology mixes could be installed within study area
- Process allows for various renewable groups to study common area to find proper aggregation

2007 Case with 1,000 MW of DG

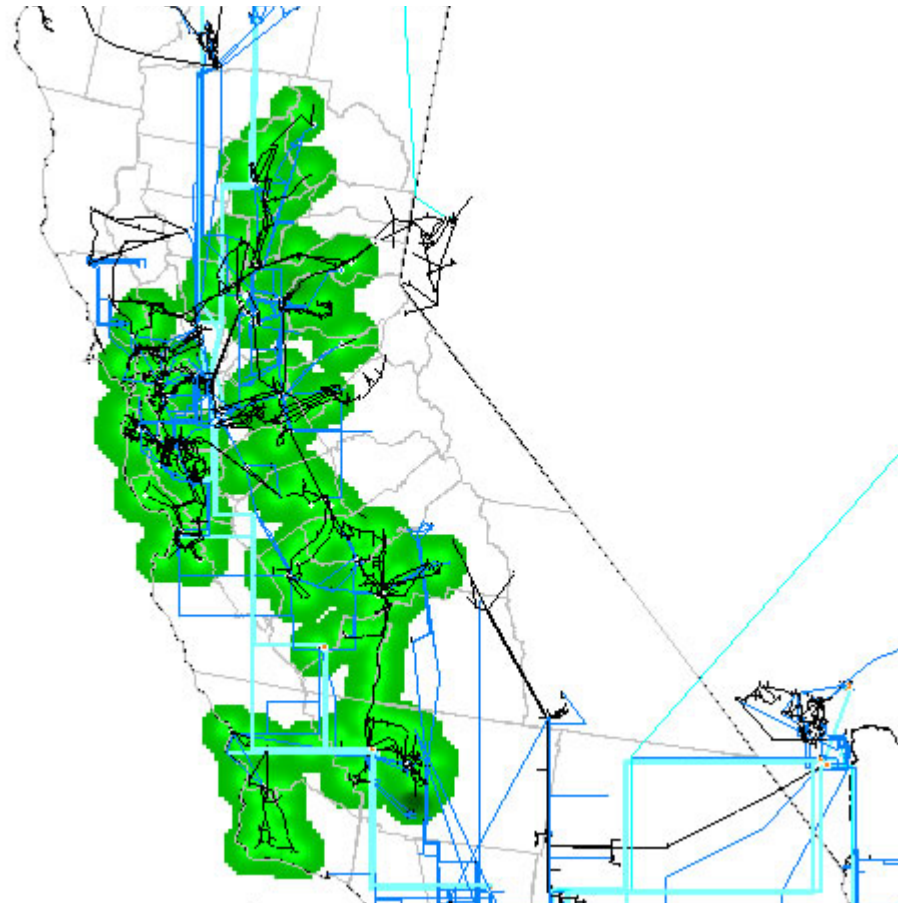
Before



After



Distribution of the 1,000 MW of Distributed Generation



1000MW Distribution by County

Alameda	34	Mendocino	0	Santa Cruz	7
Amador	8	Merced	17	Shasta	0
Butte	40	Modoc	0	Sierra	3
Calaveras	5	Monterey	17	Solano	4
Colusa	0	Napa	2	Sonoma	0
Contra Costa	10	Nevada	9	Stanislaus	32
El Dorado	17	Placer	64	Sutter	32
Fresno	48	Plumas	2	Tehama	0
Glenn	0	Sacramento	16	Trinity	0
Humboldt	0	San Benito	3	Tulare	3
Kern	128	San Bernardino	1	Tuolumne	1
Kings	7	San Francisco	8	Yolo	19
Lake	0	San Joaquin	58	Yuba	27
Lassen	0	San Luis Obispo	48	Unmatched	251
Madera	14	San Mateo	10	TOTAL 1028	
Marin	26	Santa Barbara	49		
Mariposa	2	Santa Clara	7		

105 MW of DG in Santa Clara and Sacramento Counties

- CDF forecasted new housing potential for Santa Clara and Sacramento Counties at about 105 MW for each county.
- Assumed 50% penetration for new housing
- Distributed DG over the 69 and 115 kV buses

Benefit Ratio Comparison

	AMWCO Reduction	Benefit Ratio
2007 Base Case	-----	-----
2007 w/1,000 MW of DG	2,440	2.44
2007 w/105 MW of DG in two counties	663	6.31

Conclusions

- If properly located, DG can reduce transmission overloads and congestion. If improperly located, DG can increase overloads
- By predefining areas of optimal penetration, studies can be conducted by various departments on the available renewables in the location.
- Provides a forum for aggregating renewable technologies
- Care must be taken in how DG is distributed